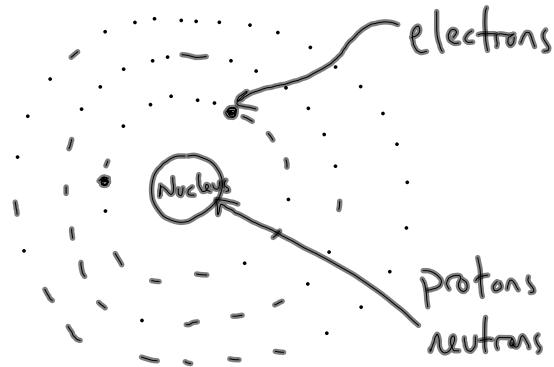


Electricity:

- Charge:



| <u>particle</u> | <u>mass</u> | <u>charge</u> |
|-----------------|----------------------------|---------------|
| proton | $\sim 10^{-27} \text{ kg}$ | $+1$ |
| neutron | $\sim 10^{-27} \text{ kg}$ | \emptyset |
| electron | $\sim 10^{-31} \text{ kg}$ | -1 |

- Electrons are relatively easily moved (as compared to protons), so that charge may build up on certain surfaces.

- Most often, there is a net charge of \emptyset on most surfaces. This means there are equal #'s of protons and electrons.

- Electrons may move very easily through metals.
- If the material is solid but not metal, charge can be placed on the object. \rightarrow the object would then have net negative charge.
- Conductor \rightarrow something that allows easy movement of electrons (metals)
- Insulator \rightarrow something that resists electron movement
- Charge of an electron/proton
 $1.6 \times 10^{-19} \text{ C}$.

- Coulomb's law:

$$F = \frac{k |q_1| |q_2|}{r^2}$$

absolute value of charges

↳ distance bet. charges

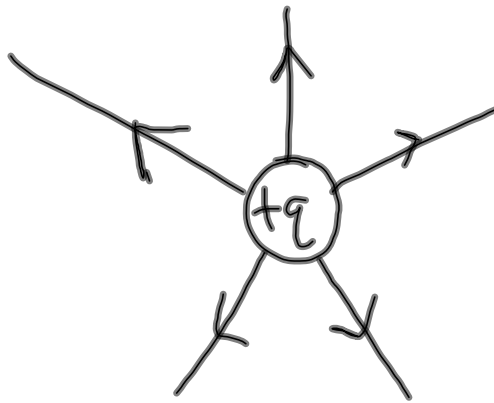
↳ Coulomb's constant 8.99×10^9

↳ electric force $N \cdot m^2 / C^2$

- Figure out direction based on attraction or repulsion.
- Like charges repel; unlike charges attract.

- Electric Field:

- Around every charged particle is an electric field.
- Arrows point away from + charges, towards - charges.



- Calculate electric field:

$$\vec{E} = \frac{\vec{F}}{q}$$

\vec{F} → electric force
 q → charge
 \vec{E} → electric field